

## CLAIMS

What is claimed is:

1. A data receiver comprising:
  - a limiting amplifier comprising a plurality of amplifier stages;
  - 5 and
  - a peak detector measuring a voltage level of an input to said limiting amplifier, an input to said peak detector being connected directly to an input of a first one of said plurality of amplifier stages of said limiting amplifier;
- 10 wherein a mismatch in impedance of transmission lines used between said input to said peak detector and said input of said first one of said plurality of amplifier stages of said limiting amplifier is minimized such that said peak detector appears as a load with insignificant capacitance with respect to an extremely high data rate of a signal on said input.
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  2. The data receiver according to claim 1, wherein:
    - an impedance of said transmission line is between 33 ohms and 75 ohms throughout a frequency range of operation.
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  3. The data receiver according to claim 2, wherein:
    - said frequency range of operation is between 10 MHz and 12 GHz.
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  4. The data receiver according to claim 1, further comprising:
    - a latch circuit connected to an output of said peak detector.
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  5. The data receiver according to claim 4, wherein:
    - said peak detector and said latch circuit form a loss of signal circuit detecting a loss of signal input to said limiting amplifier.

6. The receiver according to claim 1, wherein:  
said extremely high data rate of said signal on said input is  
at least OC48 equivalent.

5           7. The data receiver according to claim 1, wherein:  
said extremely high data rate of said signal on said input is  
at least OC192 equivalent.

8. The data receiver according to claim 1, further  
10 comprising:

a bias generator used to bias both said input to said peak  
detector as well as said input to said first one of said plurality of amplifier  
stages.

15           9. A method of measuring a signal having an extremely high  
data rate of at least 2.5 Gb/s input to a limiting amplifier, comprising:

minimizing a mismatch of impedance between an input to a  
first stage of said limiting amplifier, and transmission leads connected  
between said input to said first stage of said limiting amplifier and an input  
20 to a peak detector such that said peak detector appears as a load with  
insignificant capacitance with respect to an extremely high data rate of a  
signal on said input; and

directly measuring through an input to said peak detector  
connected directly to a first stage of said limiting amplifier a signal having  
25 a data rate of at least 2.5 Gb/s being input to said first stage of said  
limiting amplifier.

10. The method of measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 9, wherein:

an impedance of said transmission line is maintained  
5 between 33 ohms and 75 ohms throughout a frequency range of operation.

11. The method of measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to  
10 claim 10, wherein:

said frequency range of operation is between 10 MHz and  
12 GHz.

12. The method of measuring a signal having an extremely  
15 high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 9, further comprising:

biasing said peak detector bias with a same bias used to bias said first stage of said limiting amplifier.

20 13. The method of measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 9, wherein:

said extremely high data rate of said signal on said input is at least OC48 equivalent.

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14. The method of measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 9, wherein:

said extremely high data rate of said signal on said input is  
30 at least OC192 equivalent.

15. The method of measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 9, further comprising:

5                   latching an output of said peak detector.

16. The method of measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 15, wherein:

10                  said latching provides a loss of signal indication relating to said signal input to said first stage of said limiting amplifier.

17. Apparatus for measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier, comprising:

15                  means for minimizing a mismatch of impedance between an input to a first stage of said limiting amplifier, and transmission leads connected between said input to said first stage of said limiting amplifier and an input to a peak detector using differential transmission lines such that said peak detector appears as a load with insignificant capacitance  
20                  with respect to an extremely high data rate of a signal on said input; and

                      means for directly measuring through an input to said peak detector connected directly to a first stage of said limiting amplifier a signal having a data rate of at least 2.5 Gb/s being input to said first stage of said limiting amplifier.

25                  18. The apparatus for measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 17, wherein:

                      an impedance of said transmission line is between 33 ohms  
30                  and 75 ohms throughout a frequency range of operation.

19. The apparatus for measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier according to claim 18, wherein:

5           said frequency range of operation is between 10 MHz and 12 GHz.

20. The apparatus for measuring a signal having an extremely high data rate of at least 2.5 Gb/s input to a limiting amplifier  
10 according to claim 17, further comprising:

means for biasing said peak detector bias with a same bias used to bias said first stage of said limiting amplifier.